UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201-3367

010229

RECEIVED
JUL 06 2001

July 2, 2001

Jane R. Summerson, EIS Document Manager
Yucca Mountain Site Characterization Office
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
P.O. Box 30307, M/S 010
North Las Vegas, NV 89036-0307

Dear Dr. Summerson:

The Nuclear Waste Technical Review Board appreciates the opportunity to comment on the Department of Energy's (DOE) recently published supplement to its draft environmental impact statement (EIS) for a geologic repository at Yucca Mountain, Nevada. The Board submits these comments as part of its responsibility under the Nuclear Waste Policy Act, as amended, to evaluate the scientific and technical validity of the activities carried out by the Secretary of Energy and the DOE Office of Civilian Radioactive Waste Management.

1 The Board believes that the technical basis for projecting the long-term performance of the base-case (high-temperature) repository design has weaknesses. They include the apparently large uncertainties in projections of repository performance caused by the relatively high temperatures produced by the base-case design. The Board has urged the DOE to evaluate a low-temperature design so that its performance (and uncertainties in performance) can be compared with that of the high-temperature design. The DOE decided to address this area of Board concern by taking a single general repository design (referred to as the "Science and Engineering Report [S&ER] flexible design") and comparing its performance and associated uncertainties when it is operated at a high temperature and at a representative lower temperature. This choice was influenced, in part, by the fact that the same process models and performance assessments could be used to evaluate both the higher- and the lower-temperature design concepts. Information in the *Supplemental Science and Performance Assessment* report should provide some indication of the validity of this analytical approach. The final EIS should justify use of the S&ER design operated in a low-temperature mode as a surrogate for a true low-temperature design for purposes of projecting environmental effects, especially long-term releases of radionuclides to the environment.

2... The supplement to the draft EIS shows, in Table 3-14, that the peak annual dose and the time of the peak are exactly the same for the higher- and lower-temperature operating modes. Because corrosion rates, coupled processes, and the size of the repository footprint are likely to be temperature-dependent, the Board is concerned that this result may reflect model limitations. In its September 2000 letter to the DOE,* the Board identified a number of limitations in the DOE's performance assessment models that could hinder an accurate prediction of the effects of

* Letter from Jared L. Cohon, Board chairman, to Dr. Ivan Itkin, dated September 20, 2000.

Telephone: 703-235-4473 Fax: 703-235-4495

2 cont. temperature on repository performance. The Board recommends that the DOE revise its performance assessment models to capture the effects of temperature more accurately, allowing an improved assessment of the merits of higher-temperature versus lower-temperature repository designs.

3 Section 3.2.3 discusses the predicted long-term performance of a Yucca Mountain repository. According to this section, predicted radiation doses during the first 10,000 years are zero ". . . because waste packages would remain intact for more than 10,000 years." Unclear from this section is whether the analysis considered the potential for defective waste packages to be produced that could fail in less than 10,000 years, potentially causing radiation doses earlier than predicted in the supplemental draft EIS. The final EIS should discuss the potential for early (first 10,000 years) waste package failures.

For the S&ER design, the waste packages may contain more potentially toxic metals, such as chromium and nickel, because stainless steel has replaced carbon steel as a component of the packages. The final EIS should provide new estimates of the concentrations of these elements that humans could be exposed to through groundwater near Yucca Mountain and should evaluate the potential cumulative public health and environmental hazards that could occur if groundwater also contains radionuclides released from a Yucca Mountain repository.

The Board realizes that the potential environmental impacts of transportation were addressed in the draft EIS and that those impacts are not the subject of this supplemental draft EIS. The Board previously offered its views on transportation impacts when it commented on the draft EIS and expects the DOE to respond to those comments when it prepares the final EIS.

Again, the Board appreciates the opportunity to comment on the supplemental draft EIS for a Yucca Mountain repository.

Sincerely,

Jared L. Cohon

Jared L. Cohon
Chairman

jlc104vf